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PTO/SB/64 (10-01)

Approved for use through 10/31/2002. OMB 0651-0031

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**PETITION FOR REVIVAL OF AN APPLICATION FOR PATENT ABANDONED
UNINTENTIONALLY UNDER 37 CFR 1.137(b)**

Docket Number (Optional)

MFS-31613-1

First named inventor: FORD, Donald B.

Application No.: 09/922,169

Art Unit: 3641

Filed: 08/06/2001

Examiner: JOHNSON, S.

Title: Cross Cell Sandwich Core

FAX RECEIVED

Attention: Office of Petitions
Assistant Commissioner for Patents
Box DAC
Washington, D.C. 20231

FEB 19 2003

PETITIONS OFFICE

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APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION

NOTE: A grantable petition requires the following items:

- (1) Petition fee;
- (2) Reply and/or issue fee;
- (3) Terminal disclaimer with disclaimer fee --required for all utility and plant applications
filed before June 8, 1995; and for all design applications; and
- (4) Statement that the entire delay was unintentional.

1. Petition fee☐ Small entity-fee \$_____ (37 CFR 1.17(m)). Applicant claims small entity status. See 37 CFR 1.27.☒ Other than small entity - fee \$ 1300.00 (37 CFR 1.17(m))**2. Reply and/or fee****A. The reply and/or fee to the above-noted Office action in**the form of Amendment and Response (identify type of reply):

- ☐ has been filed previously on _____
- ☒ is enclosed herewith.

B. The issue fee of \$_____

- ☐ has been paid previously on _____
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[Page 1 of 2]

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3. Terminal disclaimer with disclaimer fee

- ☒ Since this utility/plant application was filed on or after June 8, 1995, no terminal disclaimer is required.
- ☐ A terminal disclaimer (and disclaimer fee (37 CFR 1.20(d)) of \$ _____ for a small entity or \$ _____ for other than a small entity) disclaiming the required period of time is enclosed herewith (see PTO/SB/63).

4. STATEMENT: The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(b) was unintentional. [NOTE: The United States Patent and Trademark Office may require additional information if there is a question as to whether either the abandonment or the delay in filing a petition under 37 CFR 1.137(b) was unintentional (MPEP 711.03(c), subsections (III)(C) and (D))].

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2/19/2003

Date

Telephone
Number: 256 544-0013
SignatureJames J. McGroary

Typed or printed name

LS01/Office of Chief Counsel

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Marshall Space Flight Center, AL 35812Enclosures: ☒ Fee Payment☒ Reply☐ Terminal Disclaimer Form☐ Additional sheets containing statements establishing unintentional delay☐ Other: _____

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2/19/2003

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Ford
Serial No.: 09/922,169
Filing Date: August 6, 2001
For: CROSS CELL SANDWICH CORE

Examiner: S. Johnson
Group A. U.: 3641

Assistant Commissioner for Patents
Box No Fee - Amendment
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AMENDMENT AND RESPONSE

Dear Sir:

In response to the Official Action of June 25, 2002, received in the above-captioned patent application, please amend said application as follows on the attached pages. A clean copy of the claims as amended is enclosed as required by 37 C.F.R. 1.121.

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REMARKS

In the aforesaid Official Action, claims 1-17 are pending. Claims 2, 4-5, 13 have been temporarily withdrawn as being directed to non-elected inventions. Claims 1, 3, 6-12, and 14-16 were rejected. Claims 9, 11, and 14-17 have been cancelled without prejudice or disclaimer through the enclosed amendment.

35 U.S.C. §112 Rejections

Claims 1, 3, 6-12 and 14-16 have been rejected under 35 U.S.C. §112 as being indefinite. Specifically, the Office Action states that the phrases “perpendicular axis” and “first perpendicular axis” are not clear as to what structure is intended to be perpendicular to the claimed axis for claim 1. Claim 10 has been stated to have similar problems for the use of the phrase “second perpendicular axis”. Claims 9 and 15 have been cancelled without prejudice or disclaimer.

The Applicant has amended these two claims with the enclosed amendment to address the clarity of the claimed structure. The “perpendicular” adjective has been removed from the description of the respective axes, and each of the axes are respectively defined and now claimed as extending perpendicular to the first and second faceplates where the respective axis intersects the faceplates (i.e., at the points of intersection with the faceplates, the axis is perpendicular to that faceplate). While the applicant originally believed the claims as originally filed were clear on this issue, the proposed language is believed to clear up all doubt as to what is meant by the “perpendicular” axes.

Since the three-dimensional structure is very important in this case, the Applicant appreciates the Examiner bringing up this issue so that all doubt may be resolved at this early juncture.

Most honeycomb or cross cell structures are constructed with vertically oriented ribbons such as those shown in Minamida et al., U.S. Patent No. 5,116,688. The ribbons extend perpendicularly to the faceplates, not angled obliquely to perpendicular axes extending through the faceplates.

As reflected by the Ray and Yancey references, some cross cell structures have core strips which are horizontally oriented (i.e., at 90 degrees relative to those in Minamida et al. These strips have valleys and ridges, but they do not extend continuously along the height of the strips from the top of the bottom faceplate to the bottom of the top faceplate. In fact, it is only along the thickness that the strips extend from the top of the bottom faceplate to the bottom of the top faceplate at spaced apart locations. Furthermore, at spaced apart locations, the strips are not angled relative to the width direction of the strips as claimed.

The Office Action expresses some confusion as to how the first and second walls can be considered to be at ninety degrees relative to one another and still be obliquely angled relative to the first perpendicular axis for claim 12. Without understanding this concept, it would be almost impossible to be able to interpret the claims of this application.

The Applicant has attempted to explain this concept in the specification at paragraphs 19 and 20 by way of illustration to a sheet of corrugated tin. Another good way to visualize what is claimed would be to open a folder so that it has a ninety degree angle between the two covers. The two surfaces, or covers, which meet at ninety degrees along the spine can be equated to wall portions. Next, set the folder down on the desk with it still open at ninety degrees. Now, while maintaining the walls at ninety degrees from one another, tilt the spine of the folder (where the two walls meet) at an angle of

about 45 degrees (obliquely) relative to the desk. Now imagine a first perpendicular axis extending through the desk (i.e., a faceplate) and through one of the walls and a second perpendicular axis extending through the second wall. This is essentially the angular relationship which the Applicant is attempting to claim in the various claims. Of course, there are other limitations in the claims like the walls would extend from the top of the bottom faceplate to the bottom of the top faceplate which is not done in this simple illustration, but hopeful this will illustrate what the Applicant is attempting to claim through the selected claim language.

DRAWINGS

The Examiner has objected to the drawings for failing to include a claimed third perpendicular axis. The specification is very clear from paragraph number 16 to paragraph number 20 where the Applicant has explained the nature of the "perpendicular" axes in great detail. It makes no difference where any of the "axes" are drawn on the figure, only that the axes extend perpendicularly through the top and bottom faceplates and through wall portions. Nevertheless, since claim 15 has been cancelled without prejudice or disclaimer, there is not believed to be a need to clutter the figures with additional axis lines parallel to axes 38,40.

ANTICIPATION REJECTIONS

Claims 1, 3, 6-12, and 14-16 have been rejected as anticipated by Minamida et al., U.S. Patent No. 5,116,688. This rejection must stem from the initial confusion over the angular relationship of the "perpendicular" axes.

Minamida et al. shows a honeycomb core having first and second faceplates and a plurality of ribbons and first and second walls. However, the first and second walls in Minamida et al. are perpendicular to the first and second faceplates. The first and second

walls are not obliquely angled relative to a perpendicular axis extending through the first and second faceplates. In fact, the first and second walls would be parallel to the "perpendicular axis" or "first axis" as claimed, and not "obliquely angled" as required by amended claim 1, and its dependent claims.

Claims 1, 3, 6-12 and 14-16 were also rejected as anticipated by Czaplicki, U.S. Patent No. 5,028,474. Czaplicki shows a cellular core structure having alternating sequences of ridges and valleys formed of a continuous unbroken sheet material. The Examiner has prepared an excellent and proper rejection for the subject matter as originally claimed for both independent claims 1 and 9. The opposing surfaces 20 in Czaplicki are obliquely angled relative to perpendicular axes running through them.

Accordingly, claim 1 has been amended to require the ribbons to be parallel and spaced apart (i.e., separated) from one another. As explained in paragraphs 19 -20, a good visualization would be the cutting of corrugated tin at an oblique angle into strips. The strips are then laid parallel to one another intermediate the parallel top and bottom faceplates. At least some of the wall portions of the strips are not perpendicular or parallel to the top and bottom faceplates which is a claimed element in claim 1.

In Czaplicki, the single sheet is formed into valleys and ridges. There is no teaching in Czaplicki for ribbon construction, and there is no suggestion in how it could be adapted to do so. Additionally, since the Czaplicki reference is single sheet construction, it does not teach or suggest the dispersion of forces as the ribbons would do since the energy would likely be deflected into the fold of the valleys instead of onto the faceplate. This construction could magnify the intensity of impacting projectiles rather than reduce as the claimed construction is believed to do. Accordingly, the claimed

ribbon construction is believed to be preferable to the "unbroken sheet" construction of Czaplicki.

Accordingly, as amended, claims 1, 3, 6-8, 10 and 12 are not believed to be anticipated, or rendered obvious by the Czaplicki reference.

Claims 1, 3, 6-12 and 14-16 have also been rejected as obvious in light of Ray, U.S. Statutory Invention Registration No. H1621. Ray shows a cross cell sandwich core having ribbon internal construction. As originally filed, claims 1 and 9 were properly rejected by the Ray reference.

Independent claim 1 has been amended to require that the ribbons extend continuously along their width from the top of the bottom faceplate to the bottom of the top faceplate. In Ray, no matter how the cross sectional area of the panel is viewed, there are openings in the walls of the ribbons which does not meet this limitation of the claims as amended. From a practical point of view, the strips in Ray are not aligned as claimed by the applicant. They do not have wall portions which extend continuously intermediate the two faceplates which is utilized to deflect forces as explained in the specification as originally filed. Furthermore, the ribbons in Ray do not bend along their width as claimed.

Claims 1, 3, 6-12 and 14-16 have also been rejected as obvious in light of Yancey, U.S. Patent No. 3,869,778. In Figure 7 of Yancey, a very similar structure to that shown in Ray is disclosed. The core strips are horizontally oriented. The independent claims, as originally filed, were properly rejected in view of Yancey.

As affected by the enclosed amendment, the structure of Yancey is believed to have been distinguished exactly like the structure of Ray.

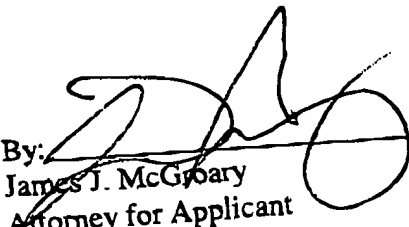
CONCLUSION

Accordingly, claims 1, 3, 6-8, 10 and 12 are now believed to be allowable as affected by the enclosed amendment. If claim 1 is allowed then examination of claims 2, 4-5 and 13 would then be appropriate as well as they are directed to non-elected species depending from an allowable generic claim. No new independent claims were added, and the total number of claims is less than twenty. No additional fees are due at this time.

It is therefore respectfully submitted that the claims in the present invention are in condition for allowance and such action is hereby solicited.

Respectfully submitted,

Date: September 24, 2002

By: 
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Attorney for Applicant
Reg. No. 38,960
NASA/Marshall Space Flight Center
LS01/Office of Chief Counsel
Marshall Space Flight Center, AL 35812

***** VERSION SHOWING CHANGES MADE *****

1. (Amended) A cross cell sandwich core structure comprising:

a first and second faceplate spaced apart from one another and substantially parallel to one another;

a plurality of spaced apart and separated ribbons located between the first and second faceplates, the ribbons extending in height from a top surface of the first faceplate to a bottom surface of the second faceplate and extending in width substantially parallel to one another along a length of the first and second faceplates, said ribbons extending continuously from the top surface of the first faceplate to the bottom surface of the second faceplate across the width of the ribbons.

wherein each of the plurality of ribbons has at least one wall portion angled relative to the width of the respective ribbon, and said at least one first wall portion is obliquely angled relative to a [perpendicular] first axis extending through said first and second faceplates and the at least one first wall portion, said first axis perpendicular to the first and the second faceplates where it crosses through the first and second faceplates, respectively.

[9. A cross cell sandwich core structure comprising:

a first and second faceplate spaced apart from one another, said first and second faceplates substantially parallel to one another;

a plurality of walls located between the first and second faceplates, the walls extending in height from a top surface of the first faceplate to a bottom surface of the second faceplate; and

wherein a first wall of the plurality of walls is angled obliquely relative to a first perpendicular axis extending through the first and second faceplates.]

10. (Amended) The cross cell sandwich core structure of claim [9] 1 further comprising a plurality of second wall portions of the plurality of [walls] ribbons [is] obliquely angled relative to a second [perpendicular] axis extending through the first and second faceplates, said second axis perpendicular to the first and second faceplates where the first axis extends through the first and second faceplates, respectively, and said second wall portion connected to and adjacent to the first wall portion.

[11. The cross cell sandwich core structure of claim 10 wherein the first and second wall connect to one another.]

12. (Amended) The cross cell sandwich core structure of claim [11] 10 wherein the first and second wall are angled at about ninety degrees relative to one another.

13. (Amended) The cross cell sandwich core structure of claim [11] 1 wherein the first and second wall portions are angled at about one hundred thirty five degrees relative to one another.

[14. The cross cell sandwich core structure of claim 11 wherein the first and second walls comprise a portion of a first ribbon.]

[15. The cross cell sandwich core structure of claim 14 further comprising a second ribbon, said second ribbon having at least one wall angled obliquely relative to a third axis extending through said first and second faceplates, said third axis perpendicular to the first

and second faceplates where the first axis extends through the first and second faceplates, respectively.]

[16. The cross cell sandwich core structure of claim 15 further comprising a plurality of alternating first and second ribbons.]

[17. The cross cell sandwich core structure of claim 16 wherein the wall is a portion of a first ribbon and a cross section of the first ribbon as taken parallel to the first faceplate is a sinusoidal wave.]

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1. A cross cell sandwich core structure comprising:

a first and second faceplate spaced apart from one another and substantially parallel to one another;

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a plurality of spaced apart and separated ribbons located between the first and second faceplates, the ribbons extending in height from a top surface of the first faceplate to a bottom surface of the second faceplate and extending in width substantially parallel to one another along a length of the first and second faceplates, said ribbons extending continuously from the top surface of the first faceplate to the bottom surface of the second faceplate across the width of the ribbons,

wherein each of the plurality of ribbons has at least one wall portion angled relative to the width of the respective ribbon, and said at least one first wall portion is obliquely angled relative to a first axis extending through said first and second faceplates and the at least one first wall portion, said first axis perpendicular to the first and the second faceplates where it crosses through the first and second faceplates, respectively. 10 11 12 13

2. NE
The cross cell sandwich core structure of claim 1 wherein at least one of the ribbons has a cross section as taken along a plane parallel to the first faceplate forming a substantially square wave.

3. The cross cell sandwich core structure of claim 1 wherein at least one of the ribbons has a cross section as taken along a plane parallel to the first faceplate forming a substantially rectangular wave.

4. WE

The cross cell sandwich core structure of claim 1 wherein at least one of the ribbons has a cross section as taken along a plane parallel to the first faceplate forming a substantially trapezoidal wave.

5. NE

The cross cell sandwich core structure of claim 1 wherein at least one of the ribbons has a cross section as taken along a plane parallel to the first faceplate forming a substantially sinusoidal wave.

6. The cross cell sandwich core structure of claim 1 the plurality of ribbons are connected to the first faceplate.

7. The cross cell sandwich core structure of claim 6 wherein the plurality of ribbons are connected to the second faceplate.

8. The cross cell sandwich core structure of claim 1 wherein the first and second faceplates are planar.

10. The cross cell sandwich core structure of claim 1 further comprising a plurality of second wall portions of the plurality of ribbons obliquely angled relative to a second axis extending through the first and second faceplates, said second axis perpendicular to the first and second faceplates where the first axis extends through the first and second faceplates, respectively, and said second wall portion connected to and adjacent to the first wall portion.

A3 12. The cross cell sandwich core structure of claim 10 wherein (the first and second wall) are angled at about ninety degrees relative to one another.

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13. The cross cell sandwich core structure of claim 1 wherein the first and second wall portions are angled at about one hundred thirty five degrees relative to one another.